What is claimed is:

1. An isolated and purified biologically active Ring box protein comprising a polypeptide having an amino acid sequence corresponding to SEQ ID NO:1.
2. An isolated and purified nucleic acid molecule comprising a nucleotide sequence encoding a biologically active Ring box protein having an amino acid sequence corresponding to SEQ ID NO:1.
3. The nucleic acid molecule of Claim 2 comprising SEQ ID NO:3.
4. An expression vector containing the nucleic acid molecule of any one of Claims 2 or 3.
5. A host cell containing the expression vector of Claim 4.
6. A method for producing recombinant biologically active Ring box proteins comprising the steps of:

   culturing a host cell of Claim 5 under conditions suitable for expression of the nucleic acid molecule; and

   recovering the recombinant biologically active Ring box protein from the host cell culture.
7. A recombinant Ring box protein prepared according to the method of Claim 6.
8. A protein complex useful for screening for potential therapeutic agents that would interfere with or augment Rbx1-dependent stimulation of addition of ubiquitin or a ubiquitin-like protein to any substrate targeted for modification by SCF complexes comprising a cofactor protein and one or more proteins selected from the group consisting of a cullin protein, a substrate recognition protein, and a linker protein.
9. The protein complex of Claim 8 wherein the complex is a ubiquitin ligase protein complex.
10. The protein complex of Claim 9 wherein the ubiquitin ligase protein complex is selected from the group consisting of SCF and VHL.
11. The protein complex of Claim 8 wherein the cofactor protein is Rbx1.
12. An isolated and purified ubiquitin ligase protein complex, comprising:

    a cullin protein;

    a substrate recognition protein;

    a linker protein; and

    a cofactor protein.
13. The ubiquitin ligase protein complex of Claim 12 wherein the cullin protein is selected from the group consisting of Cdc53, Cullin 1, Cullin 2, Cullin 3, Cullin 4A, Cullin 4B, and Cullin 5.

14. The ubiquitin ligase protein complex of Claim 12 wherein the substrate recognition protein is selected from the group consisting of β-TRCP, Cdc4, Grr1, VHL and Elongin C binding proteins.

15. The ubiquitin ligase protein complex of Claim 12 wherein the linker protein is selected from the group consisting of Skp1 and Elongin C.

16. The ubiquitin ligase protein complex of Claim 12 wherein the cofactor protein is Rbx1.

17. A method for screening for potential therapeutic agents that would interfere with or augment Rbx1-dependent stimulation of addition of ubiquitin or a ubiquitin-like protein to any substrate, comprising:

forming a complex *in vitro* that contains a cofactor protein and one or more proteins selected from the group consisting of a cullin protein, a substrate recognition protein, and a linker protein;

adding a test compound to interact with the complex; and

determining if the complex remains intact or is disrupted by the compound.

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18. The method of Claim 17 wherein the cofactor protein is Rbx1.

19. A method for diagnosing a predisposition of a patient to certain carcinomas, comprising

collecting a tissue or body fluid sample from a patient;

analyzing the tissue or body fluid for the quantity of Ring box protein in the tissue; and

predicting the predisposition of the patient to certain carcinomas based upon the amount of Ring box protein in the tissue or body fluid.

20. A method for treating Ring box protein associated carcinomas or augmenting metabolically deficient systems in animals comprising administering to a patient diagnosed as having a Ring box protein associated carcinoma or cellular deficiency and having been diagnosed as deficient in Ring box protein a therapeutically effective amount of a compound that enhances or augments *in vivo* the expression of the Rbx1 gene and enhances the *in vivo* the expression of the Ring box protein.

21. A method for treating Ring box protein associated carcinomas or augmenting metabolically deficient systems in animals comprising administering a therapeutically effective amount of a Ring box protein to a patient diagnosed as having a Ring box protein associated carcinoma or cellular deficiency and having been diagnosed as deficient in Ring box protein.

22. A method for evaluating the effectiveness of a therapeutic treatment for Ring box associated carcinomas, comprising

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collecting a tissue or body fluid sample from a patient suffering from a Ring box associated carcinoma and having been subjected to a therapeutic treatment for such carcinoma;

determining the amount of Ring box protein in the tissue or body fluid sample; and

comparing the determined amount or Ring box protein to a standard indicative of normal Ring box protein levels.

23. The method of Claims 19, 20, 21, and 22 wherein the Ring box protein is Rbx1.

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